## DATA EVALUATION RECORD

1. **CHEMICAL:** NTN 33893. *129099*
   Shaughnessey No. ~~129059.~~

2. **TEST MATERIAL:** NTN 33893 technical; 1-[(6-chloro-3-pyridinyl)methyl]-4,5-dihydro-$N$-nitro-1$H$-imidazol-2-amine; CAS No. 105827-78-9; Batch No. 9030211; 95.0% active ingredient; a tan powder.

3. **STUDY TYPE:** 72-2. Freshwater Invertebrate Static Acute Toxicity Test. Species Tested: Midge (*Chironomus tentans*).

4. **CITATION:** Gagliano, G.G. 1991. Growth and Survival of the Midge (*Chironomus tentans*) Exposed to NTN 33893 Technical Under Static Renewal Conditions. Report No. 101985. Prepared by Mobay Corporation, Stilwell, KS. Submitted by Mobay Corporation, Kansas City, KS. EPA MRID No. 422563-04.

5. **REVIEWED BY:**

   Louis M. Rifici, M.S.        **Signature:** *Louis M Rifici*
   Associate Scientist                    *9/28/92*
   KBN Engineering and         **Date:**
   Applied Sciences, Inc.                 *Dana [signature] 11/25/92 EFED/EEB*

6. **APPROVED BY:**

   Pim Kosalwat, Ph.D.          **Signature:** *P. Kosalwat*
   Senior Scientist
   KBN Engineering and         **Date:** *9/28/92*
   Applied Sciences, Inc.                 *[signature] 12/14/92*

   Henry T. Craven, M.S.        **Signature:**
   Supervisor, EEB/EFED
   USEPA                        **Date:**

7. **CONCLUSIONS:** In this test, only the initial 48-hour period is "core". The remainder of the test is invalid because the dilution water control and solvent control appear to have been contaminated with the test material. The 48-hour $LC_{50}$ value of 68.9 μg/l (mean measured concentration) classifies NTN 33893 as highly toxic to midge larvae. The 48-hour NOEC was 1.04 μg/l mean measured concentration.

8. **RECOMMENDATIONS:** N/A.

9. **BACKGROUND:**

*Donna Davis*

**10. DISCUSSION OF INDIVIDUAL TESTS:** N/A.

**11. MATERIALS AND METHODS:**

A. **Test Animals:** Second instar (12 days post-hatch) midge larvae (*Chironomus tentans*) were obtained from in-house cultures maintained in hard blended water. The cultures were fed a suspension of Tetramin® and cereal leaves five times per week. The temperature and photoperiod during culturing were 22 ±1°C and 16 hours of light.

B. **Test System:** Vessels used in the test were 1-l glass beakers containing 900 ml of test solution. Silica sand was used to provide a substrate depth of 0.5-1 mm. The beakers were randomly positioned in a water bath under a 16-hour light/8-hour dark photoperiod. Light intensity ranged from 40-60 ft-candles. Thirty-minute dawn and dusk simulations were used.

The primary stock solution (20 g a.i./l) was prepared by dissolving 2.1048 g of NTN 33893 in 100 ml of dimethylformamide (DMF) at 22°C. Three additional stocks were prepared by serial dilution. The test solutions were prepared by mixing an appropriate volume of appropriate stock with 1 l of dilution water.

The dilution water used was hard blended water (a mixture of treated city water and spring water) with a hardness of 118 mg/l, an alkalinity of 83 mg/l, and a pH of 8.1-8.2. The chlorine content of the water was monitored continuously to assure the residual chlorine remained <3 $\mu$g/l.

C. **Dosage:** Ten-day static-renewal test. Based on a preliminary test, seven nominal concentrations (0.33, 1.0, 3.0, 10, 33, 100, and 300 $\mu$g a.i./l), a solvent control (16.5 $\mu$l DMF/l), and a dilution water control were used.

D. **Design:** Ten midge larvae were randomly placed in each replicate chamber, two replicates per concentration. The loading was approximately 1 midge/90 ml. Test solutions were renewed every Monday, Wednesday, and Friday by siphoning the old test solutions out of the test chambers to a depth of approximately 1 cm. Fresh solutions were slowly added to avoid disturbing the test organisms. The fresh solutions were no more than 4 hours old at the time of renewal. The midges were

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fed the same food used in culturing at a rate of 0.5 ml/l of test solution.

All beakers were observed once every 24 hours for mortality and abnormal effects. At the end of the test, the midges were grouped by replicate, dried at 60°C for 24 hours, and weighed. The temperature, dissolved oxygen concentration (DO), conductivity, and pH were measured in alternating replicates of the control, solvent control, and the low, middle, and high concentrations on days 0, 3, 5, 7, and 10. The temperature of a centrally-located test beaker was also monitored continuously using a data logging device.

Samples of fresh test solutions were taken on days 0 and 5 to measure actual exposure concentrations. Old test solutions were analyzed on days 3 and 10. The concentration of NTN 33893 was determined using liquid chromatography.

E.    **Statistics:** Dilution water control and solvent control growth data were compared using a t-test. All data were tested for normality (chi-square test) and homogeneity of variances (Bartlett's test). Survival data were analyzed using Fisher's Exact test. Test levels with significantly lowered survival were excluded from further analyses. Growth data were analyzed using one-way analysis of variance (ANOVA) and Dunnett's test. The 24, 48, 72, 96, and 240-hour $LC_{50}$ values and associated 95% confidence intervals were determined using a computer program developed by Stephan et al. (1978).

12.   **REPORTED RESULTS:** No undissolved test substance was observed in the test chambers during the test. The mean measured concentrations were 0.67, 1.24, 3.39, 10.2, 34.5, 102, and 329 $\mu$g a.i./l (Table 2, attached). These values represented 99-203% of nominal concentrations. The control solutions were contaminated with the test material on three of five occasions. The average concentration in the dilution water control and solvent control was 0.20 and 0.15 $\mu$g/l, respectively. "No biological effects were observed in the controls and possible contamination of the samples may have occurred during sample extraction."

The mortality of midge larvae are given in Table 3 (attached). The 96-hour $LC_{50}$ was 10.5 $\mu$g/l mean measured concentration (95% C.I. = 7.69-14.4 $\mu$g/l) using the probit method. The slope of the toxicity curve was 3.3. The 96-

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hour no-observed-effect concentration (NOEC), based on the lack of abnormal effects, was 1.24 $\mu$g/l.

After 10 days, survival at 3.39 $\mu$g/l was significantly lower than pooled control survival (Table 5, attached). Growth was significantly affected at 1.24 $\mu$g/l. The NOEC, based on survival and growth after 10 days was therefore 0.67 $\mu$g/l. The 10-day $LC_{50}$ was 3.17 $\mu$g/l (95% C.I. = 1.24-10.2 $\mu$g/l).

On day 0 through 7, the DO ranged from 5.8 to 7.9 mg/l or 79 to 108% of saturation at 20°C. However, on day 10, DO was 2.0-4.0 mg/l "possibly due to an increased oxygen demand created by increased food in the test chambers" (Table 7, attached). The pH values ranged from 7.1 to 8.8. The temperature was 20.8-22.3°C.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES**: The authors presented no conclusions.

    Quality Assurance and Study Compliance Statements were included in the report, indicating that the study was conducted in accordance with FIFRA Good Laboratory Practice Standards set forth in 40 CFR Part 160.

14. **REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS**:

    A. **Test Procedure**: The test design differed from the SEP for freshwater invertebrate acute tests. Significant deviations are as follows:

       This test was designed to gather survival and growth data, therefore, the midge larvae were fed during testing. The duration should have been 48 hours eliminating the addition of food to the vessels.

       The test concentrations were approximately 30% of the next highest concentration. The SEP recommends that each nominal concentration be at least 60% of next highest.

       The test solutions were as old as 4 hours at the time of renewal. The SEP states that the test solutions should be used within 30 minutes of preparation.

       The DO at test termination ranged from 2.0 to 4.0 mg/l (22 to 43% of saturation at 20°C). Dissolved oxygen levels must remain above 40% of saturation during the test.

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The author stated that conductivity was measured in alternating replicates of the control, solvent control, low, middle, and high concentration on days 0, 3, 5, 7, and 10. The results were not presented in the report.

B. **Statistical Analysis:** The reviewer used EPA's Toxanal program and mean measured concentrations to determine the 48, 96, and 240-hour $LC_{50}$ values (see attached printouts 1-3). The results were similar to those of the author's.

Growth and survival at test termination were analyzed to verify the author's 10-day NOEC. Survival at concentrations $\geq 3.39$ $\mu g/l$ was significantly lower than survival in the solvent control (see attached printout 4). Average dry weight of surviving midges at concentrations $\geq 1.24$ $\mu g/l$ was significantly lower than the solvent control (see attached printout 4). These results are the same as those of the author's.

C. **Discussion/Results:** In this test, only the initial 48-hour period is "core". The remainder of the test is invalid because the dilution water control and solvent control appear to have been contaminated with the test material. The 48-hour $LC_{50}$ value of 68.9 $\mu g/l$ (mean measured concentration) classifies NTN 33893 as highly toxic to midge larvae. The 48-hour NOEC was 1.04 $\mu g/l$ mean measured concentration.

D. **Adequacy of the Study:**

(1) **Classification:** Core for the initial 48-hour period only.

(2) **Rationale:** The remainder of the test is invalid because the dilution water control and solvent control appear to have been contaminated with the test material.

(3) **Repairability:** N/A.

15. **COMPLETION OF ONE-LINER FOR STUDY:** Yes, 09-16-92.

TABLE 2

## Measured Test Concentrations of NTN 33893 Technical

_(handwritten: 3-day mean measured concentration)_

| Nominal Concentration (µg/L; ppb) | Measured Concentration (µg/L) | | | | | Mean (±SD) | | Percent of Nominal |
|---|---|---|---|---|---|---|---|---|
| | Day 0 | Day 3* | Day 5 | Day 7* | Day 10* | | | |
| Control | ND <0.1 | ND <0.1 | 0.16 | 0.28 | 0.15 | 0.20 | (0.07) | ----- |
| Sol. Control | ND <0.1 | 0.11 | 0.17 | ND <0.1 | 0.18 | 0.15 | (0.04) | ----- |
| 0.33 | 0.48 | 0.59 _.54_ 0.94 | | N/A | 0.68 | 0.67 | (0.20) | 203 |
| 1.0 | 1.06 | 1.02 _1.04_ 1.46 | | N/A | 1.43 | 1.24 | (0.23) | 124 |
| 3.0 | 3.21 | 2.96 _3.09_ 3.16 | | N/A | 4.23 | 3.39 | (0.57) | 113 |
| 10 | 10.4 | 10.2 _10.3_ 10.1 | | N/A | 10.2 | 10.2 | (0.12) | 102 |
| 33 | 35.4 | 33.2 _34.3_ 35.0 | | ----- | ----- | 34.5 | (1.2) | 99 |
| 100 | 107 | 97.5 _102.3_ ----- | | ----- | ----- | 102 | (6.7) | 102 |
| 300 | 335 | 324 _329.5_ ----- | | ----- | ----- | 329 | (7.8) | 110 |

* = These samples were the old test solutions prior to renewal.

N/A = Not Analyzed

SD = Standard Deviation

TABLE 3

CUMULATIVE MORTALITY OF CHIRONOMIDS
EXPOSED TO NTN 33893 TECHNICAL

| Measured Concentration (µg/L; ppb) | Cumulative Number of Dead Organisms Study Day | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Control | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| Sol Control | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0.67 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.39* | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 3 | 4 | 10 | 11 |
| 10.2* | 0 | 1 | 1 | 1 | 10 | 13 | 17 | 17 | 18 | 19 | 20 |
| 34.5* | 0 | 1 | 7 | 16 | 19 | 20 | -- | -- | -- | -- | -- |
| 102* | 0 | 0 | 8 | 15 | 20 | -- | -- | -- | -- | -- | -- |
| 329* | 0 | 3 | 20 | -- | -- | -- | -- | -- | -- | -- | -- |

* - Significantly different ($P < 0.05$) compared to other test levels and controls.

TABLE 5

DRY WEIGHT OF SURVIVING CHIRONOMIDS
EXPOSED TO NTN 33893 TECHNICAL

| Measured Concentration (µg/L; ppb) | REP | Number of Chironomids Surviving | Total Dry Weight of Surviving Chrionomids | Average Dry Weight of Each Chironomid |
|---|---|---|---|---|
| Control | I | 10 | 0.0196 g | 1.96 mg |
|  | II | 9 | 0.0193 g | 2.14 mg |
| Sol. Control | I | 10 | 0.0226 g | 2.26 mg |
|  | II | 10 | 0.0216 g | 2.16 mg |
| Pooled Controls |  | 39 | 0.0831 | 2.13 mg |
| 0.67 | I | 10 | 0.0208 g | 2.08 mg |
|  | II | 10 | 0.0204 g | 2.04 mg |
| 1.24* | I | 10 | 0.0152 g | 1.52 mg |
|  | II | 10 | 0.0192 g | 1.92 mg |
| 3.39* | I | 5 | 0.0021 g | 0.42 mg |
|  | II | 4 | 0.0015 g | 0.38 mg |

* - Significantly different (P <0.05) from pooled controls.

TABLE 7

Dissolved Oxygen and pH Measurements During the
10-Day Exposure of *Chironomus tentans* to NTN 33893 Technical

| Nominal Concentrations (μg/L; ppb) | Day 0 DO | Day 0 pH | Day 3 DO | Day 3 pH | Day 5 DO | Day 5 pH | Day 7 DO | Day 7 pH | Day 10 DO | Day 10 pH |
|---|---|---|---|---|---|---|---|---|---|---|
| Control | 7.6 | 8.1 | 6.8 | 7.8 | 6.3 | 7.1 | 6.6 | 7.7 | 2.0 | 7.3 |
| Sol. Control | 7.4 | 8.8 | 7.1 | 7.9 | 6.7 | 7.4 | 5.8 | 7.7 | 3.4 | 7.4 |
| 0.33 | 7.0 | 8.8 | 7.3 | 7.8 | 7.1 | 7.5 | 7.0 | 7.8 | 3.0 | 7.4 |
| 10* | 7.3 | 8.8 | 7.3 | 7.8 | 7.3 | 7.6 | 7.2 | 7.9 | 4.0 | 7.5 |
| 300** | 7.4 | 8.8 | 7.2 | 7.9 | --- | --- | --- | --- | --- | --- |

DO = Dissolved oxygen in mg/L.

* - Water quality parameters were measured in the 3 μg/L test level on Day
    10 to due the complete mortality of test organisms in the 10 μg/L test
    level.

** - Water quality parameters were measured in the 100 μg/L test level on Day
    3 to due the complete mortality of test organisms in the 300 μg/L test
    level.

*day 3 mean measured concentrations*  ·  *48-hour LC₅₀*

```
RIFICI  NTN 33893  CHIRONOMUS TENTANS  09-16-92
*****************************************************************
CONC.     NUMBER          NUMBER          PERCENT         BINOMIAL
          EXPOSED         DEAD            DEAD            PROB.(PERCENT)
 329.5    20              20              100             9.536742E-05
 102.3    20               8               40             25.17223
  34.3    20               7               35             13.1588
  10.3    20               1                5             2.002716E-03
   3.09   20               1                5             2.002716E-03
   1.04   20               0                0             9.536742E-05
    .54   20               0                0             9.536742E-05
```

THE BINOMIAL TEST SHOWS THAT 10.3 AND 329.5 CAN BE
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.


AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 118.3196


RESULTS CALCULATED USING THE MOVING AVERAGE METHOD
```
SPAN      G            LC50            95 PERCENT CONFIDENCE LIMITS
 3        6.572961E-02  ⟵————— 68.94127       49.35569 - 98.45378
98.45378
```

*LMR*
*9/16/92*

RESULTS CALCULATED USING THE PROBIT METHOD
```
ITERATIONS        G         H        GOODNESS OF FIT PROBABILITY
    5           .1061265    1              7.839239E-02
```

```
SLOPE   =                 1.690331
95 PERCENT CONFIDENCE LIMITS = 1.139671    AND    2.240991

LC50 =     68.87281
95 PERCENT CONFIDENCE LIMITS =  44.81775 AND  111.5195

LC10 =     12.21
95 PERCENT CONFIDENCE LIMITS =  5.017858 AND  20.75928
*****************************************************************
```

*96-hour LC₅₀*

RIFICI   NTN 33893   CHIRONOMUS TENTANS   09-16-92
**************************************************************

| CONC. | NUMBER EXPOSED | NUMBER DEAD | PERCENT DEAD | BINOMIAL PROB.(PERCENT) |
|-------|---------------|-------------|--------------|-------------------------|
| 329   | 20 | 20 | 100 | 9.536742E-05 |
| 102   | 20 | 20 | 100 | 9.536742E-05 |
| 34.5  | 20 | 19 | 95  | 2.002716E-03 |
| 10.2  | 20 | 10 | 50  | 58.80985     |
| 3.39  | 20 | 1  | 5   | 2.002716E-03 |
| 1.24  | 20 | 0  | 0   | 9.536742E-05 |
| .67   | 20 | 0  | 0   | 9.536742E-05 |

THE BINOMIAL TEST SHOWS THAT 3.39 AND 34.5 CAN BE
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.


AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 10.2


RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

| SPAN | G | LC50 | 95 PERCENT CONFIDENCE LIMITS |
|------|---|------|------------------------------|
| 6    | 5.135013E-02 | ⟵————11.43877 | 7.679475 - *17.03832* |

~~17.03832~~ ⟵


RESULTS CALCULATED USING THE PROBIT METHOD

| ITERATIONS | G | H | GOODNESS OF FIT PROBABILITY |
|------------|---|---|----------------------------|
| 6 | .1373512 | 1 | .9999185 |

SLOPE    =              3.310458
95 PERCENT CONFIDENCE LIMITS = 2.083571    AND    4.537344

LC50 =    10.45897
95 PERCENT CONFIDENCE LIMITS =  7.686511 AND  14.42776

LC10 =    4.323704
95 PERCENT CONFIDENCE LIMITS =  2.343523 AND  6.104206
**************************************************************

10- day LC50

```
RIFICI   NTN 33893   CHIRONOMUS TENTANS   09-16-92
**********************************************************************
CONC.    NUMBER        NUMBER        PERCENT       BINOMIAL
         EXPOSED       DEAD          DEAD          PROB.(PERCENT)
 329     20            20            100           9.536742E-05
 102     20            20            100           9.536742E-05
 34.5    20            20            100           9.536742E-05
 10.2    20            20            100           9.536742E-05
 3.39    20            11            55            41.19014
 1.24    20             0             0            9.536742E-05
  .67    20             0             0            9.536742E-05
```

THE BINOMIAL TEST SHOWS THAT 1.24 AND 10.2 CAN BE
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.


AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 3.172205


WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE
PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE
NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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MIDGE SURVIVAL AFTER 10 DAYS

### SUMMARY OF FISHERS EXACT TESTS

| GROUP | IDENTIFICATION | NUMBER EXPOSED | NUMBER DEAD | SIG (P=.05) |
|-------|----------------|----------------|-------------|-------------|
|       | CONTROL        | 20             | 0           |             |
| 1     | 0.67 µg/l      | 20             | 0           |             |
| 2     | 1.24           | 20             | 0           |             |
| 3     | 3.39           | 20             | 11          | *           |
| 4     | 10.2           | 20             | 20          | *           |
| 5     | 34.5           | 20             | 20          | *           |
| 6     | 102            | 20             | 20          | *           |
| 7     | 329            | 20             | 20          | *           |

422563-04, NTN 33893, midge dry weight

t-test of Solvent and Blank Controls          Ho:GRP1 MEAN = GRP2 MEAN

| | | |
|---|---|---|
| GRP1 (SOLVENT CRTL) MEAN = | 2.2100 | CALCULATED t VALUE = 1.5541 |
| GRP2 (BLANK CRTL) MEAN   = | 2.0500 | DEGREES OF FREEDOM = 2 |
| DIFFERENCE IN MEANS      = | 0.1600 | |

TABLE t VALUE (0.05 (2), 2) = 4.303    NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 2) = 9.925    NO significant difference at alpha=0.01

Shapiro Wilks test for normality
Data PASS normality test at P=0.01 level. Continue analysis.

Bartletts test for homogeneity of variance
Data PASS homogeneity test at 0.01 level. Continue analysis.

### ANOVA TABLE

| SOURCE | DF | SS | MS | F |
|--------|----|----|----|----|
| Between | 4 | 4.404 | 1.101 | 53.548 |
| Within (Error) | 5 | 0.103 | 0.021 | |
| Total | 9 | 4.507 | | |

Critical F value =   5.19  (0.05,4,5)
Since  F > Critical F  REJECT  Ho:All groups equal

DUNNETTS TEST   -   TABLE 1 OF 2          Ho:Control<Treatment

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | MEAN CALCULATED IN ORIGINAL UNITS | T STAT | SIG |
|-------|----------------|------------------|-----------------------------------|--------|-----|
| 1 | solvent control | 2.210 | 2.210 | | |
| 2 | dilution contrl | 2.050 | 2.050 | 1.116 | |
| 3 | 0.67 µg/l | 2.060 | 2.060 | 1.046 | |
| 4 | 1.24 | 1.720 | 1.720 | 3.417 | * |
| 5 | 3.39 | 0.400 | 0.400 | 12.623 | * |

Dunnett table value = 2.85    (1 Tailed Value, P=0.05,  df=5,4)

DUNNETTS TEST   -   TABLE 2 OF 2          Ho:Control<Treatment

| GROUP | IDENTIFICATION | NUM OF REPS | Minimum Sig Diff (IN ORIG. UNITS) | % of CONTROL | DIFFERENCE FROM CONTROL |
|-------|----------------|-------------|-----------------------------------|--------------|-------------------------|
| 1 | solvent control | 2 | | | |
| 2 | dilution contrl | 2 | 0.409 | 18.5 | 0.160 |
| 3 | 0.67 µg/l | 2 | 0.409 | 18.5 | 0.150 |
| 4 | 1.24 | 2 | 0.409 | 18.5 | 0.490 |
| 5 | 3.39 | 2 | 0.409 | 18.5 | 1.810 |

```
-------------------------------------------------------------------------
TITLE:     422563-04, NTN 33893, midge dry weight
FILE:      a:42256304.dt1
TRANSFORM: NO TRANSFORMATION                      NUMBER OF GROUPS: 5
-------------------------------------------------------------------------

GRP  IDENTIFICATION   REP      VALUE        TRANS VALUE
---  ---------------- ----  -------------   -------------
 1   solvent control   1      2.2600          2.2600
 1   solvent control   2      2.1600          2.1600
 2   dilution contrl   1      1.9600          1.9600
 2   dilution contrl   2      2.1400          2.1400
 3          0.67 µg/l  1      2.0800          2.0800
 3          0.67 µg/l  2      2.0400          2.0400
 4          1.24       1      1.5200          1.5200
 4          1.24       2      1.9200          1.9200
 5          3.39       1      0.4200          0.4200
 5          3.39       2      0.3800          0.3800
-------------------------------------------------------------------------
```